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ABSTRACT

A study was devised to determine whether internal reading flexibility would be manifested by individual proficient readers, operating in the "rauding" mode (typical reading manner), and observed in a natural setting reading passages from textbook materials. Reading times were examined using both number of standard words and number of propositions read per minute. Three adult proficient readers were participants in the study. Results contradicted R. P. Carver's conclusions that under typical reading conditions, reading rate is relatively constant, varying only around 10 to 20%. When rate was determined using standard words for individual readers in this study, internal flexibility ranged from 17 to 69%, with the average degree of flexibility for all subjects 23% on a history passage and 55% on a science passage. (MKM)

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Internal Reading Flexibility - a Fact or an Artifact of Measurement?

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Research conducted by Carver (1976, 1979) has provided substantial evidence that readers tend to read materials of differing difficulty at a relatively constant rate if reading is done under typical or normal reading conditions, and if rate is measured in a way that controls for word length.

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Carver (1977-1978) labels reading "in a typical manner" as "rauding." Rauding occurs when an individual is attending to meaningfully connected discourse and is understanding each thought as it is attended to. Rauding theory holds that reading is relatively constant in a typical reading situation, and by using the standard length word as a tool for measuring rate, Carver has called into question long-held assumptions about external reading flexibility.

Does this apparent consistancy of rate also hold true within passages read in the rauding mode? McCracken introduced the concept of internal reading flexibility in 1965. He describes reading as "...a process of accelerating and decelerating, ...stop and go..." in which the reader's rate within a passage is affected by the density of the ideas presented, and, presumably, by the fund of relevant information that the reader can bring to bear in understanding those ideas.

However, the several studies (see Rankin, 1974) that seem to support internal flexibility have not used a method that controls for word length in their analyses.

Both Carver's emphasis on understanding each though and McCracken's concern for idea density suggest another way of looking at internal flexibility. Might internal rate be determined, to at least some degree, by the number of idea units present in the

material being read? Propositional analysis offers a way of examining this, and research done by Kintsch and Keenan (1973) offers evidence that, with number of words controlled, text containing more propositions does require longer reading time. However, certain task constraints of this laboratory study limit its applicability to the question at hand; since the charge to the subjects was to read to remember, it is not likely that the subjects were operating in the rauding/typical reading mode.

The purpose of this study was to determine whether or not internal reading flexibility would be manifested by individual proficient readers, operating in the rauding mode, and observed in a natural setting reading passages from textbook materials. Reading times are examined using both number of standard words and number of propositions read per minute.

Method

Material

The passages read were selections from introductory level college textbooks. Each passage chosen, though several paragraphs long, functioned as independent piece of discourse; i.e., it developed one idea and knowledge of preceeding or succeeding paragraphs was not important to understanding its contents. One

252-word passage of three paragraphs was from a history text and had a readability of tenth grade as estimated by the Fry Readability Scale. The second was a 265-word passage of four paragraphs taken from a chemistry textbook and of eleventh grade readability according to the Fry. A similar passage from a psychology text served as a practice selection. Each was typed on a single page, and horizontal red lines were drawn to remind the subjects of the ends of paragraphs.

For each paragraph, a word and standard word (Carver, 1976) count was established. In addition, each passage was analyzed, using Kintsch's system of propositional analysis was explicated by Turner and Greene (1977), to determine the number of propositions per paragraph.

Subjects

Three adult proficient readers, two females and one male, were paid participants in the study. Each had obtained a score above the ninetieth percentile, using the Grade 16 norms, on the Nelson Denny Reading Test, Form A, administered one week before the study was conducted. All three had had graduate course work in reading, and they considered themselves to be flexible readers; i.e., they stated that they were certain that they altered both

their reading rates and strategies to fit their purpose and the material being read. The subjects were not told the purpose of the study until after they had been tested.

Procedure

Subjects were tested individually by one of the authors. Each was seated comfortable at a table with the passages directly in front and the auditory signal, a touch-action bell, placed at the right hand. They were instructed to read the passages in the way they typically read materials -- to understand each idea as they went along. At the end of the paragraph, marked by the red line, they were asked to strike the bell and immediately continue reading the next paragraph. They were told that after reading each paragraph they would be asked to write anything they remembered about the passage and that they would bw given as much time as they needed. However, they were told not to be concerned about that task -- it was not a test, only a verification that they had indeed read the material. They were cautioned: "Do not alter your reading approach in any way to help you remember more. It is important that you simply read to understand -- the way you typically read." For each passage, a short readiness statement was provided: "This passage is from a _____ text; its topic is _____." The first passage

read was used as a practice selection to help the subjects become accustomed to using the bell and to ensure that they understood and were following the instructions.

Paragraph reading times were recorded by the experimenter during the session, and also tape-recorded for later verification.

Data Analysis

A percentage measure of flexibility for each subject on each passage was determined by using the equation

$$\frac{\text{Rate of Paragraph X -- Rate of Paragraph Y}}{\text{Average Rate of Passage}} \times 100$$

where Paragraph X is the paragraph read at the fastest rate and Paragraph Y is the paragraph read at the slowest rate.

Results

Both examination of the recalls and verbal verification by the subjects confirmed that they did understand what was read.

Table 1 contains the rate of reading for each paragraph for each subject in standard words per minute. Table 2 contains the rates in propositions read per minute.

Examination of the data in Table 1 shows that the degree of flexibility observed ranged from 17 to 34 percent for individual subjects on the history passage and from 29 to 69 percent on the science passage.

Insert Table 1 about here

Examination of the proposition per minutes scores in Table 2 shows a degree of flexibility ranging from 22 to 32 percent on the history passage and 39 to 86 percent on the science passage.

Insert Table 2 about here

Discussion

Carver (1979) concludes that under typical reading conditions, reading rate is relatively constant, varying only around 10 to 20 percent. When rate was determined using standard words for individual readers in this study, internal flexibility ranged from 17 to 69 percent with the average degree of flexibility for all subjects 23 percent on the history passage and 55 percent on the science passage.

Two alternatives must be considered. If the subjects were operating in the rauding mode, then it appears that the consistency

of rate observed for many readers across passages may not hold true for the individual reader within passages.

It also might be argued that these subjects were not rauding the passages, either because of the task constraints, or, because they were atypical readers due to their educational backgrounds. Further, the slower rates and greater internal flexibility observed for the science passage tends to suggest that at least one of the subjects went into the study mode in reading it.

Finally, while idea density very likely is a factor that influences rate, a simple count of propositions alone was not a particularly useful technique for examining internal flexibility in this study. In fact, this analysis demonstrated an even wider range of flexibility than did the analysis by standard words, and serves as a reminder that factors such as the reader's background of related information and his/her ability to apply this knowledge also probably influence rate of understanding.

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Table 1
Inner-Passage Rates, Total Reading Rates, and Percent Flexibility in Standard Words per Minute

	Sub.	Paragraph Number 1	2	3	4	$\bar{X}$ Rate	Flexibility
HISTORY	R	225	175	248	-	216	34%
	B	377	351	319	-	349	17%
	L	268	293	323	-	295	19%
	$\bar{X}$	280	273	296	-	287	(8%)
SCIENCE	R	95	143	73	120	108	65%
	B	434	298	292	219	310	69%
	L	282	226	229	214	238	29%
	$\bar{X}$	270	222	198	184	219	(39%)

Table 2
Inner-Passage Rates, Total Reading Rates, and
Percent Flexibility in Propositions Read per Minute

	Sub.	Paragraph Number 1	2	3	4	$\bar{X}$ Rate	Flexibility
HISTORY	R	85	85	105	-	91	22%
	B	142	169	132	-	147	25%
	L	101	141	136	-	126	32%
	$\bar{X}$	109	132	124	-	121	(19%)
SCIENCE	R	47	52	34	52	46	39%
	B	213	108	134	95	138	86%
	L	139	82	105	93	105	54%
	$\bar{X}$	133	80	91	80	96	(55%)